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## TECHNICAL INFORMATION COLLECTION AND ASSESSMENT EFFORTS - FINAL REPORT

Anthony J. LaRocca

September 1994

Submitted to:  
Defense Technical Information Center  
Cameron Station, Room 5B205  
Alexandria, VA 22304-6145

Attn: Dr. Forrest R. Frank

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## Introduction

This is part of the final deliverable report for D.O. 51, Technical Information Collection and Assessment Effort, to account for participation of the Infrared Information Analysis Center in the SBIR Conference in Houston, TX, under a directive from DTIC.

Following this Introduction is a Summary Section followed in turn by a section called Followup Inquiries. This section gives details of inquiries called in to IRIA subsequent to participation in the SBIR Conference in Houston. After this is a section called First Deliverables which is actually a reproduction of a report sent earlier to the sponsor, DTIC, to discuss the IRIA activity at the conference and to review details of the responses to inquiries at the conference.

The final section of this report is an Appendix, which is a collection of the actual interchange of communications between IRIA and the persons making inquiries.

## Summary

The Infrared Information Analysis (IRIA) Center has participated in an activity originated by the Defense Technical Information Center (DTIC) for Technical Information Collection and Assessment to test the ability of DoD IACs to provide technical assistance to SBIR program participants at the National SBIR Conferences and in followup inquiries. Part of IRIA's responsibility is to provide information on subject matter related to electro-optics acquired from expertise within ERIM and from data in its computerized database. The IRIA database has been for over 40 years second only to DTIC in providing the defense community with information on topics of EO/IR substance. Recently its emphasis on data collection, to allay the excesses of overlap with DTIC, has been on the all-important papers generated in the presentations at the meetings of IRIS and the IRIS Specialty Groups.

The IRIA audience has been until recently exclusively the defense community of the US government and US government defense contractors. Whereas this relationship will continue, we are expected to skew the flow of this type of information toward the non-defense community as a result of the recent emphasis by Congress on dual-use technology and technology transfer; and because of the relaxation of classification procedures resulting from the end of the cold war. From the standpoint of the IACs, DTIC's decision to siphon IAC activity into the commercial (SBIR) market has been an overriding factor in helping effect the movement of information into broader reception.

As mentioned above the IRIA collection recently comprises mainly the papers presented at the various IRIS meetings devoted to all kinds of EO/IR subjects such as detectors, sensors and sensor fusion, materials, targets and backgrounds, imaging, signal

processing, and many others. The collection is large and so far only a small percentage of these papers, approximately 250, is releasable to the general public. But more of these papers each year are being published unclassified, albeit some still with certain limitations, but others free of restrictions.

This report documents IRIA compliance with Task objectives of providing technical assistance to SBIR program participants at the National SBIR Conference in Houston, TX, and in followup inquiries. The report of the trip to Houston described in the Attachment to this report demonstrates IRIA's (adjunct) participation in the SBIR conference, and the Appendix contains statements of the information requested by the participants and the IRIA responses to these inquiries. It should be noted that the inquirers were often tentative in their approach to the service offered them and were driven to a large extent by curiosity in what IRIA had to offer. Each inquiry was answered to include an explanation of IRIA's mission and the makeup of its various sources of information, and with an offer to try to respond to the participant's specific inquiry.

The Rationale in the Statement of Work of providing participants with independent technical information was satisfied from the viewpoint of IRIA's expertise in the area of Infrared and Electro-optics. However, in the case of SBIR participants that expertise is tempered by the fact that the information usually contained in IRIA's responses is often of a restrictive nature since a large part of IRIA's collective knowledge of the EO/IR subject is classified. This limitation, however, might slowly erode as a result, partly, of the effort of those committed to satisfaction of the directive for dual-use technology and of technology transfer.

This mindset will help DTIC realize the benefits of the SBIR program to better understand its requirements and to demonstrate the role of IACs for future involvement. In IRIA's case the start

has been slow as shown by the relatively small number of inquiries at the SBIR Conference and the number of inquiries since then. In the case of the Conference, full participation by the IACs in the exhibition area itself would have increased IAC exposure and encouraged participants to seek IAC help. The poor followup response is in part (perhaps large part) due to a lack of advertisement.

At the present time IRIA is restricted in exposing its activities to any but the government and defense contractors. But most of the basic IR/EO work is totally unrestricted and published in the open literature. IRIA has easy access to this literature and has responded to a few SBIR requests using this medium. But the actual state of military art in the IR/EO area is to be found in the various IRIS meetings, and it is this medium from which dual-use technology and technology transfer can be effective. Although a large part of this IRIS collection is classified, there is much information which is unclassified; but the dissemination is limited to a large, but select, community, not, for the most part, the much larger SBIR community. Of course, it may not be good business sense for insiders to open the technology to greater competition by exposing its essence to the larger SBIR community. The clever innovator, on the other hand, will find a way to get inside even with the small percentage of information available. Aside from the US government, the chief IRIA customer base comprises the defense contractor. But from the standpoint of information dissemination IRIA is neutral and should be available to respond to insiders and outsiders alike. It appears that DTIC's effort to get the IACs involved in gatherings like the SBIR conferences is at least one appropriate way to get the SBIR community to know of the existence of the IACs.

This final report is composed of three parts. The first part, which follows immediately, is a summary of the responses to inquiries to IRIA since the end of the National SBIR Conference in Houston, TX. The second part is a reproduction of the initial trip

report containing summaries of responses made at the Conference. The third is an Appendix containing the actual responses to the inquiries and/or memoranda of those responses, either from the Conference itself or from followup inquiries.



### Followup Inquiries

This is the final deliverables report for D.O. 51, Technical Information Collection and Assessments Effort, to account for activity since the publication of the first deliverable, Report #253845-3-R, June 1994.

Several requests for information of an SBIR nature were made, to which responses were variably informative depending on the relevance of the request.

One of the first requests for information was from Mr. Ted Whitney of a small consulting company, Pacific Infrared. The initial contact was by phone and the response was by phone and fax. His request was not a typical SBIR request and required searching the IRIS-IRIS database for information he was aware existed in our files, having been in the defense IR business for a number of years. He was interested in finding certain papers having to do with phase fresnel lenses and binary optics, published by authors known in the field of diffractive optics. His request was very specific in that he had a solicitation on Hybrid Diffractive Optics and was interested in papers authored by G. Swanson, W. Veldkemp, G. Morris, and L. Forester dating from 1984 to 1988. He cited several companies working in the field among which are Texas Instruments, Honeywell, Lincoln Labs, Perkin-Elmer. A search of the system turned up 6 records, all unclassified. Our response to him was by fax, notifying him that, because of the limited (though unclassified) nature of the collection, we were unable to respond positively to an IRIS non-subscriber. Our suggestion was to have a sponsor request the collection and handle it in any way he believes appropriate. The collection is in the IRIA archives. No attempt is made here to reproduce the output.

In July an e-mail message was sent to A. J. LaRocca from Nahun Gat. The only address available from Dr. Gat is his e-mail address. See Appendix. Response was made to him also through e-

mail. In his message he indicated that he had just completed a Phase I SBIR with JPL for the design of certain components for an LWIR imaging spectrometer. In a Phase II proposal he plans to complete the device using a 128 x 128 Si:As FPA operating above 7 micrometers. The recommendation for him to contact IRIA came from the project monitor at JPL, Mr. Clayton LeBaw because of ERIM's intimacy with the subject, resulting from participation in similar projects. He indicated he would keep in touch.

We responded by e-mail indicating that ERIM has been engaged in work leading to the design and construction of an IR imaging spectrometer. We suggested that he contact Larry Peterson of ERIM for further discussions on the subject.

In August A. J. LaRocca received a phone call from Mr. David Elkin of the Space Telescope Science Institute at 3700 San Martin Drive, Baltimore, MD. He was interested in obtaining an ERIM report published in the 1970s. He was referred to the ERIM library which presumably had a copy that might be copied and sent to him provided it met the criterion for unlimited distribution.

We followed through in a few weeks to see if Mr. Elkin was satisfied and found that the report he sought was one by H. Rose and the ERIM title was Handbook of Albedo and Thermal Earthshine, Report #190201-1-T, 1973. The report seems to have vanished, having not been found in NTIS, DTIC, or IRIA archives.

Also in August a call was received from Richard Brennan with a small company, New England Photoconductor, anticipating a future need for IRIA services if the company was successful with an SBIR solicitation to be issued in late September. The memo in the Appendix gives a few details about what IRIA knows about the company.

In September we received a phone call from Robert Johnson of a very small company called Quality Control Braze, Inc., of Orting,

WA (near Tacoma), phone: 206-893-5791 (same as the FAX number). The company does silver soldering and brazing and is considering turning exclusively to soldering. In particular, they are interested in hardening the edges of miniature, two-flute, twist drills for building precision equipment. The drills are metal-injection molded and have the brittleness of cast metal, and they want to invent a process to lay down a hard thin spot on the cutting edges of the flutes. They have looked at plasmas, diamond deposition (apparently nondesirable because of the cobalt in drill steel), chemical vapor deposition (CVD), and gaseous vapor deposition (GVD). They have learned of a new technique of electronic spark deposition (ESD), pulsed to deposit a hard metal such as titanium carbide.

Their research further turned up an article out of Livermore on laser heating which got them interested in the possibility of a process similar to ESD using something tantamount to laser welding. They became interested in the copper-vapor laser and wanted to know as much as they could about its characteristics. We directed Mr. Jansen to NIST, where we believe he could expect to find expertise in the area of lasers. A quick search of the tables in Laser Focus Magazine showed that the Cu-vapor laser can be very powerful, indeed.

## First Deliverable

This report is written to satisfy the deliverables requirement of D.O. 51, Technical Information Collection and Assessment Efforts, for attendance and participation in the name of DTIC at a National SBIR conference in Houston, Texas. The trip report by A.J. LaRocca is reproduced as follows.

### Trip Report

I attended the first plenary session on 26 April which was the welcoming and introductory session. The SBIR staff people of described the program in general and set the tone for the rest of the meeting. The moderator then introduced the directors of the SBIR programs supported by different government agencies. Among them were the Army, Navy, Air Force, ARPA, NSF, and one or two others. I learned that the program is funded at a yearly rate of about \$700M, to be increased eventually (about FY96 or FY97 or so) to \$1.2 to \$1.4B.

The various SBIR directors described their own programs, such as funding and types of programs supported. The details of the program were shown on slides which are not designed to be reproduced, so I don't know if we can expect proceedings from the meeting. That is no serious loss to the IACs because our interaction with the program will have to be through DTIC.

For the rest of the day I traded off computer sitting with Ruth Chatton of IRIA, but neither one of us had any visitors; nor do any of the other IACs seem to have had any, except perhaps the software IAC, who, I believe, had one. And I believe that might be because he was closest to the door and was able to satisfy curiosity.

I attended one of the night sessions of the meeting and found that there was nothing of general interest, but mostly directed to

specific technologies. There seems to have been mention in isolated places about the existence of the IACs at the meeting, but the information was brief enough to get past the casual listener. DTIC had its own display in the general sessions area and Brian McCabe manned it from time to time trying to whip up interest in attendance in the IAC area which, unfortunately, was relegated to one of the regular hotel rooms at the end of a hall with a small sign that was not easily observable.

On the second day Ruth and I attended the plenary session during which the moderator urged attendees to make one-on-one contacts with the various government personnel in regard to the intricacies of the SBIR program and fleetingly mentioned the technical assistance to be had in Room 321 (the IAC room). He introduced the sole speaker who gave a rather interesting presentation on entrepreneurship citing his own experience in producing a sort of 3-D Xerox machine for making computer-designed parts. After this session we went back to Room 321 to operate our station.

I get the impression that a large segment of the group at this meeting is biologically (medically) oriented. I don't know if that has much to do with less than enthusiastic interest in IACs that concentrate mainly on the physical sciences and mainly defense.

On the third day I attended the general session and learned about STTR "Small Business Technology Transfer." It requires that the small business team up with an educational or non-profit institution in which the small business gets at least 40% of the allocation and the non-profit gets at least 30%. Many companies are involved in the SBIR program as well as all of the government agencies. I heard this morning (3rd day) papers from NASA, DOE, DOD, representing the services, etc.

The final plenary session talk was delivered by DOD about the support of SBIR with not much new added to what was discussed

previously.

My guess is that the meeting achieved its purpose in that the attendees took advantage of all of the opportunities offered. I'm sure that if the IACs had been visible we would have seen many more visitors than the seven we had, if only because the participants were curious about everything that went on at the meeting. The IACs were relegated to the 3rd floor of the hotel. In comparison, at the general meeting there was a large ballroom in the main area, designated "one-on-one", in which the participants were given the opportunity to speak individually to various representatives of government and industry.

The room was large enough to have accommodated the IAC representatives as well. Each IAC had a computer and some auxiliary equipment such as printers, modems, etc. These could have all been left home in lieu of "pencil and pad" for note taking, to be translated later into real output and mailed at an appropriate time. We managed to attract 7 curious people to whom I expect to respond with whatever information they sought. If we had been in the mainstream we would have attracted many times more.

The IAC people were really only free to attend the plenary sessions which were the most interesting from the point of view of the overall intent of the meeting. The other meetings were focused on special topics of SBIR interest. There was plenty of direction given in the plenary sessions and lots of discussion which was of importance to those wanting to start up their own businesses. I heard the IACs mentioned only once in the plenary sessions and mainly as a passing comment. I am aware that Brian McCabe went down to the ballroom area to stir up interest in the IACs, but it did not seem to have much of an effect. Nothing actually could have worked like our being in the heat of the activity.

## Responses to Inquiries

This section is devoted to responses made to individuals whose interest was sufficient for them to inquire about specific topics of importance to them.

SBIR Search Request for:

Theodore Konopelski  
Semiconductor Laser International  
129 Rosebrook Drive  
St. Louis, MO 63031-8633

Mr. Konopelski was interested in information on semiconductor laser diodes. Part of his interview is missing from the notes, so the service provided to him is based on what was remembered of the interview, which was mainly an interest in what other companies were doing in his field of semiconductors. I assured him that very little would turn up in the defense literature, since, whereas much unclassified literature has been published, most of it would be restricted to use by defense contractors.

I searched the open literature and found much on the subject of semiconductor laser diodes; so much, in fact, that it had to be limited by restricting the output to specifically the actual construction of the devices, which of course, arbitrarily discounts some probably useful records.

In a desire to find out more about his company, I searched the Photonics Buyers Guide, but did not find it listed. One can not draw conclusions from this fact because I would not put too much faith in the Guide's use of the index. However, I would presume that the company is relatively small.

I sent the results of the search to Mr. Konopelski with

recommendation on getting further information. All of the people interviewed were sent information on the services provided by IRIA.



SBIR Search Request for:

Jerry Ayers

Ayers Engineering & Manufacturing

P.O. Box 1525

1202 Creelman Lane

Ramona, CA 92065

Mr. Ayers provides services for clients who have an interest in high-temperature applications. One area of intersection with IRIA was in Nernst light sources which he apparently produces for use with products not necessarily conventionally used in the technology of infrared. Nernst Glowlers, for instance, have been around and used in infrared instrumentation for a long time, without much change in appearance or application.

He was hoping to use IRIA as a point of contact and was attempting to locate a paper published by the Red River Army Depot having to do with Nernst Glowlers and Globars. However, nothing turned up in a search of DTIC on the source code assigned to this Depot. I did an open literature search on the subject and sent it to him; but the output would have been only of peripheral interest to him. I directed him to the Photonics Buyers Guide as a source of companies engaged in the production of infrared sources, finding, however, no particular references to sources of these types.

SBIR Search Request for:

Three of the visitors to the IRIA station at the Houston SBIR conference sought only general information about IRIA in particular and the IACs in general and wanted to be put on the IRIA distribution list for descriptive information that could be sent to them. These names and the names of all others were given to IRIA representative, Dan Kennard, with the request to send them all that was allowed.

One of those requesting only this service was

John M. Downing  
Pinnacle Systems Group  
354 Brookwood Drive  
Downingtown, PA 19335  
Phone: 215-269-9066  
FAX: 215-269-6468

Another person interested in this information was

Judith Ingalls  
Director  
Technology Center  
SBDC Border Region  
1222 N. Main, STE 450  
San Antonio, TX 78212  
Phone: 210-558-2458

She was mainly interested in information that would help her position as intermediary in the transfers of technology between government and her small business clients.

A third person was

Hubert H. Chu  
Envirotech Consulting  
13627 Barryknoll  
Houston, TX 77079

SBIR Search Request for:

Howard Erlichman  
E4 Investment Services  
161 East 90th Street, 3A  
New York, NY 10128  
Phone: 212-831-5091  
FAX: 212-427-2358

Mr. Erlichman's overall interest was non-destructive testing. He wanted to be aware of what was going on in that field in regard to the use of Infrared Technology. It appears that his specific interest was examination of aircraft through proper image interpretation. I do not believe he had a specific approach in mind, but wanted to observe what information could be derived from the literature as related to possible approaches.

We failed to determine precisely what his own technological involvement is, but considering the nature of his company, a technical person could be beneficial to any newcomers to the field of IR non-destructive testing.

A search was performed on the unrestricted DTIC collection with the strategy being the non-destructive testing of aircraft. Although there were several documents covering the subject for infrared, there were no unrestricted documents. Thus, under the presumption that the requester might be interested in other phase of non-destructive testing the few unrestricted documents not necessarily including IR were downloaded from DTIC and sent to Mr. Erlichman.

He might have gotten a similar collection from the NTIAC if he were to have consulted them during the meeting.

SBIR Search Request for:

Jaswinder Sandhu  
SANTEC Systems, Inc.  
708 S. Milwaukee Ave.  
Wheeling, IL 60090  
Phone: 708-215-8884

Mr. Sandhu did not visit the IAC center but I talked with him at the reception and invited him to call me at his leisure. He did so and I found that he was interested in nondestructive testing. He was interested in using liquid crystals as inexpensive detectors. Mr. Sandhu, like many other SBIR participants were very needful of IAC expertise, and this is why it was unfortunate that there was no organized bringing together of the two groups.

I explained to him that liquid crystals had been used for years in some way as infrared detectors, but without much practicality. He wanted a tutorial on IR and I recommended Hudson's book on Infrared System Engineering.

I searched the open literature, including NTIS, on liquid crystals as detectors and limited the time range to the last 5 years at his suggestion. This was appropriate because not limiting would have retrieved an impractical number of records. I also searched DTIC and found 6 records, 3 of which were unrestricted. These were sent to Mr. Sandhu.

SBIR Search Request for:

Donald C. DeLucia  
Vice President  
DeLucia & Associates  
201 Suffolk Avenue  
College Station, TX 77840-3017  
Phone: 409-696-2225  
FAX: 409-693-5758

The discussion with Mr. DeLucia covered such topics as what the IACs were, what IRIA was in particular and what IRIA could do for his company. Of the several people we received, some, like Mr. DeLucia were susceptible to help from IRIA because their interests resided in the topics we pursue. Like many of the participants at the conference, in general, he wanted his company to become more familiar with IR and be involved in it. One of his interests was detection of humans at a distance, for a number of uses from IFF to locations of persons in dangerous situations.

He was particularly interested in focal plane arrays, but his knowledge of the subject was very basic. The unlimited literature on this subject can contain some basic matter, so, along with recommending his reading Hudson's book on Infrared System engineering, I did a search of DTIC and found 49 records which have been sent to him by mail.

## APPENDIX



Investment Services

June 1, 1994

Anthony J. LaRocca, Physicist  
ERIM  
P.O. Box 134001  
Ann Arbor, MI 48113-4001

Dear Anthony:

Thank you for your letter and accompanying database searches relating to the possible application of infrared (and other) technologies to the NDT/inspection/metrology marketplace.

I hope to contact you again once I've had a chance to review the citations in detail.

In the meantime, thanks again for your assistance and I look forward to developing a dialogue with you and ERIM in the months ahead.

Sincerely,

A handwritten signature in cursive script that reads "Howard Erlichman".

Howard J. Erlichman



**ERIM**P.O. Box 134001  
Ann Arbor, MI 48113-4001

INFRARED INFORMATION ANALYSIS CENTER

313-994-1200

TELEX 4940991 ERIMARB  
FAX 313-994-5550  
Ext. 2214May 24, 1994  
IRIA-AJL-94-128

Mr. Howard Erlichman  
E4 Investment Services  
161 E. 90th Street, 3A  
New York, NY 10128

Dear Mr. Erlichman:

It was interesting to talk to you and others at the SBIR conference in Houston and to learn of the breadth of interest from small businesses in the field of infrared technology. Infrared has many uses in the civilian arena, and I would attribute its lack of broader application to the very high cost of much infrared equipment. Your field of nondestructive testing is particularly susceptible to the use of infrared techniques. There have been many papers written on the subject. Some of them have appeared in the open literature and I have included samples from a search of that literature covering aircraft.

There is also a larger collection to be obtained from the Defense literature, but none of those retrieved on infrared were of a completely unrestricted nature. However, since I presumed that your interest was nondestructive testing, and not necessarily limited to infrared, I nonetheless retrieved documentation covering other techniques that might be of interest to you.

As a result of these searches you will find two collections, one from the open literature on infrared and one from the Defense database on other techniques. If I can be of further help, please call me on (313) 994-1200, extension 2302.

Sincerely,

Anthony J. LaRocca  
Physicist

AJL:nah  
Enclosure

**ERIM**P.O. Box 134001  
Ann Arbor, MI 48113-4001

313-994-1200

TELEX 4940991 ERIMARB  
FAX 313-994-5550  
Ext. 2214May 19, 1994  
IRIA-AJL-94-123

Mr. Jaswinder Sandhu  
SANTEC Systems, Inc.  
708 Milwaukee Ave.  
Wheeling, IL 60092

Dear Mr. Sandhu:

Enclosed are two collections of information on the subject of your interest; i.e., liquid crystal IR detectors. The larger collection comes from a search of the open literature. Some papers may be quite pertinent to your interests, other only peripherally. Most of the journals should be found in the University library to which you have access. I hope, by the way, you were able to find a copy of Hudson's book.

The other, smaller collection is from a search of the Defense Technical Information Center (DTIC) collection from which there are three items that are of unrestricted nature. I do not know how you would go about getting copies of these reports, but I would suggest that you call 703-274-5260 to find directions.

If you should need further help about getting other information of an infrared nature, please contact me at 313-994-1200, ext. 2302.

Sincerely,

Anthony J. LaRocca  
Physicist

AJL:nah  
Enclosure

**ERIM**P.O. Box 134001  
Ann Arbor, MI 48113-4001

313-994-1200

TELEX 4940991 ERIMARB  
FAX 313-994-5550  
Ext. 2214May 18, 1994  
IRIA-AJL-94-124Mr. Donald DeLucia  
DeLucia & Associates  
201 Suffolk Avenue  
College Station, TX 77840-3017

Dear Mr. DeLucia:

Enclosed is a list of documents obtained from a search of the files of the Defense Technical Information Center (DTIC) on the subject of focal plane arrays (FPAs). Recall that I promised to send you this output as a result of our discussion at the SBIR conference in Houston.

If I can be of further help, please do not hesitate to contact me.

Sincerely,

Anthony J. LaRocca  
PhysicistAJL:nah  
Enclosure

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TELEX 4940991 ERIMARB  
FAX 313-994-5550  
Ext. 2214June 8, 1994  
IRIA-AJL-94-135

Mr. Jerry Ayers  
Ayers Engineering and Manufacturing  
P.O. Box 1525  
1202 Creelman Lane  
Ramona, CA 92065

Dear Mr. Ayers:

I understand from our conversation at the SBIR meeting in Houston that you were looking for a specific paper concerning Nernst Glowers. I searched the open literature on government reports under the designations of Nernst Glowers and Globars and came up with a disappointing list of references, which I will send to you nonetheless. My conclusion from this list is that there appears to be nothing new to say about these sources.

The Photonics Buyers Guide, which you should be able to find in any descent sized library lists dozens of companies that, like yourself, manufacture all kinds of radiation sources. But your company seems to be relatively unique in the specialization of Nernst Glowers. I think the reason for this is that these sources and Globars are fairly standard components for sale with spectroscopic equipment and come specially equipped with them in the purchase of these instruments.

The only suggestion for making contacts with other companies is to consult the Photonics Buyers Guide in which, as I stated before, you will find many companies that specialize in the manufacture of sources of radiation.

Sincerely,

Anthony J. LaRocca  
Physicist

AJL:nah  
Enclosure

25

IRIA—a DTIC-sponsored DoD Information Analysis Center



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313-994-1200

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FAX 313-994-5550  
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June 8, 1994  
IRIA-AJL-94-137

Mr. Theodore Konopelski  
Semiconductor International  
129 Rosebrook Dr.  
St. Louis, MO 63031-8633

Dear Mr. Konopelski:

During our meeting at the SBIR conference you showed an interest in a search of the open literature on semiconductor laser diodes, not at all surprising, considering the nature of your company. I probably did not have a sufficiently in-depth interview to find out precisely what part you play in the semiconductor laser industry.

I am sending a copy of the result of a search of the open literature on the construction of semiconductor laser diodes. There are literally hundreds of papers from the Physics Abstracts on laser diodes and I chose a small subset for you. If you have access to the Dialog database you will have a wealth of information at your disposal at a cost, I hate to emphasize, that can be, at times, prohibitively large.

I hope this helps. If you can be more specific in your need for information, perhaps we can zero in more closely on what will be of use to you.

Sincerely,

Anthony J. LaRocca  
Physicist

AJL:nah  
Enclosure



P.O. Box 134001  
Ann Arbor, MI 48113-4001

INFRARED INFORMATION ANALYSIS CENTER

313-994-1200

TELEX 4940991 ERIMARB  
FAX 313-994-5550  
Ext. 2214

June 8, 1994  
IRIA-AL-94-136

Dr. Humbert H. Chu  
Envirotech Consulting  
13627 Barryknoll  
Houston, Texas 77079

Dear Dr. Chu:

It was a pleasure to have you show an interest in our Information Analysis Center (IAC) and I am happy to send you information regarding it. As was explained, we attempt to satisfy the needs of the small business community by supplying information in different forms on the subject of Electro-optics and Infrared Technology, even to the extent of accessing the usually restricted Defense Department files for those records that can be made available to the general community.

Please accept the material I am sending to you with this letter. It will give you broad knowledge of how we are able to serve small businesses. If you have any questions, please do not hesitate to call me at 313-994-1200, ext. 2302.

Sincerely,

Anthony J. LaRocca  
Physicist

AJL:nah  
Enclosure

From: VAXC::IRIA4 13-JUL-1994 09:57:33.00  
To: SMTP%"oksi@nic.cerf.net"  
CC: IRIA4  
Subj: LWIR Imaging Spectrometer

To: Nahun Gat  
From: A.J. LaRocca

ERIM has been engaged in work leading to the design and construction of an IR imaging spectrometer. I have not been involved in this work, myself. You may, however, benefit mutually from discussions with Larry Peterson, also from ERIM, who has done considerable work in this field. You can contact him through e-mail using the address: [peterston@erim.org](mailto:peterston@erim.org). I know that he will be pleased to have discussions with you. Perhaps a phone conversation would be more appropriate. If so, his number is: 313-994-1200, ext. 2284.

Tony LaRocca

From: SMTP%"oksi@nic.cerf.net" 30-JUN-1994 23:09:19.40  
To: IRIA4  
CC:  
Subj: LWIR Imaging Spectrometer

Date: Thu, 30 Jun 94 17:04:09 PDT  
From: Nahum Gat <oksi@CERF.NET>  
Subject: LWIR Imaging Spectrometer  
To: larocca@erim.org  
X-Mailer: Chameleon - TCP/IP for Windows by NetManage, Inc.  
Message-Id: <Chameleon.4.00.940630171344.oksi@>  
Mime-Version: 1.0  
Content-Type: TEXT/PLAIN; charset=US-ASCII

30 June 1994

To: Anthony LaRocca  
ERIM  
From: Nahum Gat  
OKSI

Sir,

We have just completed a Phase I SBIR with JPL for the design of certain compone  
LWIR imaging spectrometer. A Phase II proposal is being prepared, under which w  
the complete device. It will use a 128x128 Si:As FPA and will operate in the 7.  
range.

The project monitor at JPL, Mr. Clayton LaBaw, suggested that I contact you sinc  
some time ago you expressed interets in a related topic. I would like to explor  
interest, and what ideas you may have for applications and potential users. We  
pursuing environmental sensing, but would like to make contacts with other possi

The Phase II proposal is due in about 2.5 weeks. So I'll try to contact you ne  
call or e-mail if you have any thoughts.

Cordially,  
Nahum Gat, Ph.D.  
President

Phone: 310/372-6665

Fax: 310/379-9842

Internet oks@cerfnet.com and/or oks@ nic.cerf.net



August 22, 1994  
IRIA-AL-94-179

Memo To: SBIR File  
From: A. J. LaRocca *ajl*  
Subject: Response to David Elkin

Mr. Elkin's address is Space Telescope Science Institute, phone: 410-338-5078. I could not help Mr. Elkin directly. He was interested in an ERIM report from the early 70's regarding infrared radiation seen by an instrument on a spacecraft coming from the earth.

I told him that for SBIR participants we could only respond to requests for unclassified, unlimited reports and papers. He had talked to Jayne Pace who apparently told him she had the document. I suggested he get back to Jayne and perhaps request a copy of some of the material if the report fits the criteria.

August 22, 1994  
IRIA-AL-94-180

Memo To: SBIR File  
From: A. J. LaRocca *ajl*  
Subject: Responses to Richard Brennan

Mr. Brennan's address is:  
New England Photoconductor  
253 Mansfield Ave.  
Box M  
Norton, MA 01766-0927  
Phone: 508-285-5561

This ties into D.O. 51, the SBIR program (Proj. 261708). He was not looking for anything just now, but was expecting an SBIR solicitation in late September in which he thought that his (relatively small) company could contribute to detector technology either as a prime or subcontractor. When the solicitation comes he will be able to discuss with me exactly what he needs from us on the SBIR program.

I recognize the company name from ads in the trade journals. The company apparently is small and would not be able to compete with the likes of SBRC, TI, Loral, etc., but may be able to work with them. He feels that they have sufficient expertise to become involved in more extensive detector work than they have done in the past.

IRIA-AL-94-211  
September 16, 1994

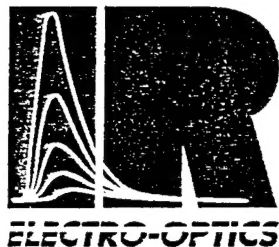
Memo To: SBIR File

From: A. J. LaRocca *ajl*

Subject: Responses to Robert Jansen

Mr. Jansen belongs to a company Quality Control Braze, Inc., in Orting, WA (near Tacoma), Phone: 206-893-5791. The company is small (maybe one-man) because the FAX number is the same. He does soldering and brazing and wants to apply soldering to injection molded miniature two-flute twist drills hardening their cutting edges by depositing a hard metal such as titanium carbide using a cu-vapor laser.

He wanted to know about the characteristics of these lasers but not from the literature, of which he has an ample supply. He wants direct contact with experts. Outside of seeking company information, the only non-competitive place I could think of was NIST, so I directed him there. He knows of NIST and thought that the suggestion was to the point.



# INFRARED INFORMATION ANALYSIS CENTER

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Ext. 2215

NUMBER OF PAGES  
(INCLUDING THIS COVER SHEET):

2

DATE SENT:

6-20-94

TO FACSIMILE NUMBER:

818-705-0970

RECIPIENT:

Ted Whitney

LOCATION:

Pacific Infrared

FROM:

A. J. LaRocca

EXTENSION NUMBER:

2302

MESSAGE:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



P.O. Box 134001  
Ann Arbor, MI 48113-4001

Ted:

I found 6 entries from IRIS proceedings authored by Swanson and by Veldkamp. They are all unclassified but limited under the ITARS restriction. I am therefore unauthorized to send them to you under the SBIR program. I am sure, however, that you must have other mechanisms for receiving them, especially if you are working on a defense contract.

Tony LaRocca

Note for the Report: The statement about ITARS is probably less restrictive than the fact that these papers could be secondarily distributed only to DoD and DoD contractors.